

REMARKS

The foregoing amendment amends Claim 1 to clarify the claimed invention. Claims 1-7 are currently pending in the application. For at least the following reasons Applicant believes that the rejections of Claims 1-7 should be withdrawn and that the claims are in condition for allowance.

The References Do Not Disclose the Claimed Difference in Thickness of the First and Second Densified Layers

The Examiner rejected Claims 1-2 and 6-7 under 35 U.S.C. 103(a) as being unpatentable over US 2003/0228949 to Okabe et al. (“Okabe”) in view of US 5,711,187 to Cole et al. (“Cole”), and rejected Claims 3-5 under 35 U.S.C. 103(a) as being unpatentable over Okabe in view of Cole as applied to Claims 1-2 and 6-7 and further in view of US 2003/0061904 to Fujiwara et al. (“Fujiwara”). As discussed below, these rejections are respectfully traversed.

Claim 1 has been amended to clarify that “the first densified layer is thicker than the second densified layer.” The claimed limitation is described throughout the specification, see for example Figure 1 and Example 1. Figure 1 illustrates a sintered gear having a first and second densified layer, wherein the thickness 21 of the first densified layer on the tooth surface 2 is thicker than the thickness 22 of the second densified layer on the bottom land 5. Example 1 describes that the sintered gear (Sample 1A) is comprised of a first densified layer of 1,000 microns and a second densified layer of 300 microns. pg. 10, ll. 30-34. Also as described in the specification, “since the bottom land and the tooth crest do not directly contact the other gear, it is unnecessary to deeply form the densified layer on them.” pg. 5, ll. 21-24. This description supports that the second densified layer on the bottom land does not have to be as thick as the first densified layer on the tooth surface.

The first densified layer on the tooth surface is provided for increasing the strength against bearing fatigue (*see e.g.*, Table 2), and the second densified layer on the bottom land is provided for reducing noise (*see e.g.*, Table 3) and imparting tension strength (*see e.g.*, pg.

5, ll. 29-36). The roles of the first and second densified layers are different, and thus the densified layers require a different thickness. In connection with the first and second densified layers of different thickness, the smooth continuation of the boundary faces makes the porosity difference, which is an important feature of the present invention.

Although Okabe describes a sintered sprocket with a densified tooth surface, Okabe is silent as to the thickness characteristics of a first and second densified layer, wherein the first and second densified layers are provided for strength and noise reduction, respectively. The sprocket “exhibits high strength and wear resistance and can be manufactured at a low cost.” Abstract. Okabe does not describe any means for noise reduction or a metallographic structure advantageous for noise reduction. Okabe does not disclose or suggest a difference in densified layer thickness, a continuous boundary face between the densified layers and a porosity difference.

Cole discloses gear wheels rolled from powder metal blanks. The “gear wheel is surface hardened by densifying at least the tooth root and flank regions to establish densification in the range of 90 to 100 percent of full theoretical density to a depth of at least 380 and up to 1,000 microns.” Abstract. Cole is silent as to the thickness characteristics of a first and second densified layer, wherein the first and second densified layers are provided for strength and noise reduction, respectively. Cole does not describe any means for noise reduction or a metallographic structure advantageous for noise reduction. Cole does not disclose or suggest a difference in densified layer thickness, a continuous boundary face between the densified layers and a porosity difference.

Neither Okabe nor Cole disclose or suggest thickness characteristics of a first and second densified layer. Based on Okabe in view of Cole, a person of ordinary skill in the art could not have created a sintered gear comprising a first and second densified layer wherein “the first densified layer is thicker than the second densified layer,” as required by amended Claim 1.

In light of the foregoing, it is respectfully submitted that Claim 1 is patentable over the cited references. Claims 2-7 depend from Claim 1 and are patentable for at least the same reasons as Claim 1.

CONCLUSION

In light of the foregoing, it is respectfully submitted that the pending claims are allowable and a notice of allowance is respectfully requested. If there are any issues that can be resolved via a telephone conference, the Examiner is invited to contact the undersigned at 404.685.6799. The Commissioner is authorized to charge any additional fees that may be due or credit any overpayment to Deposit Account No. 11-0855.

Respectfully submitted,

/Brenda O. Holmes/

Brenda O. Holmes, Esq.

KILPATRICK STOCKTON LLP
1100 Peachtree Street, Suite 2800
Atlanta, Georgia 30309-4530
Telephone: (404) 815-6500
Facsimile: (404) 815-6555
Our Docket: 44471/314269
Date: June 30, 2008